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ABSTRACT

This paper discusses the merits of cost differentials and weighted-pupil formulas as vehicles for allocating State school support funds to local school districts. The research conducted by the National Educational Finance Project to identify educational program expenditures and to develop cost differentials for each educational program in a national sample of "best practice" school districts is described. In addition, the author briefly examines a number of similar projects conducted in Florida, Indiana, Texas, and Massachusetts. Tables tha summarize the cost differential indexes developed in each project are included. (JG)

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COST DIFFERENTIALS IN STATE AID PROGRAMS IN SELECTED STATES

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The concept of equality of educational opportunity has been a part of American educational thought since the days of our founding fathers. In recent years, however, various forces have emerged to promote the achievement of equal educational opportunity for all children within given states as well as among states. In this effort to make the goal more a reality than a myth, various court cases have focused attention on the inequities which exist in many state school finance programs.

The Rodriguez-Serrano cases have focused their attention on equal access to dollars for school districts; however, this concept of equality should not be construed as resulting in a guarantee of equal educational opportunity. Equality of opportunity should more properly be defined in terms of equal access to educational programs. Under this concept each child has free access to an educational program best suited to his unique needs, abilities, and aspirations. Since a variety of data sources indicate that considerable variations exist in the cost of different educational programs, it is patently obvious that an equal amount of dollars for each child's education does not guarantee equality in educational opportunity.

The concept of pupil weights recognizes that different amounts of money will be required to afford each child free and equal access to an educational program designed to meet his unique needs. Granted, some districts consistently spend substantially more money per child than other districts to educate the same number of pupils. The development of

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specialized educational programs to meet the needs of particular types of pupils calls attention to the fact that some pupils require relatively costly educational programs. Despite the historical reference to obvious differences in expenditures per pupil in various types of programs and in various school districts, only recently have research efforts been focused on the identification of the magnitude and nature of specific types of pupils. Recent pioneering research in this area conducted under the auspices of the National Educational Finance Project has focused attention upon the cost variations which exist in educational programs offered by school districts. In the current socio-political milieu, greater public support can be generated for allocating state funds on the basis of pupils grouped according to specialized needs than to providing state funds for classroom units and teacher salaries. To state and proposition differently, legislators and public policy figures are more in agreement with providing state funds for "the child to be educated rather than for the teacher to be paid."

A major problem confronting researchers attempting to develop pupil weights or cost indices is the lack of data provided by most local school district fiscal and pupil accounting systems. Such data are normally maintained on a district-wide basis rather than on a school by school or program by program basis. In those instances where program formats exist, such formats may not coincide with the program matrix used in the studies or in the proposed state school support program. An additional problem is that researchers have on occasion encountered considerable difficulty in reconciling state and local records, thereby raising questions as to the accuracy and validity of records from either source. As a result of these circumstances most of the data utilized in recent studies have

been gathered by hand from previous records maintained by the school district.

Since current operating expense data are not normally available by programmatic category or subcategories, methods must be devised for allocating current operating expenses to program levels. One method used in some studies has been to allocate current operating expenses to various programmatic levels by computing the ratio of teaching and nonteaching academic staff in each level and then to allocate costs on this basis. Other categories of expenditures including district administration, attendance and health services, operation of plant, maintenance of plant, and fixed charges may be allocated according to student regardless of level. To accomplish this latter allocation the number of full-time equivalent students must be identified by program. Some local district bookkeeping accounting systems permit the identification of current operating expenses on a broad program level, e.g., special education and vocational education. This does provide for a more precise distribution of expenditures, but allocation to various subprograms in these broad areas must be on the full-time equivalent pupil basis. In the allocation of expenditures for instructioanl supplies and materials, the amounts are usually assigned equally on the basis of the full-time equivalent students participating in the various programs and subprograms, irrespective of the possibility that such items may not be used on a uniform basis by all participants.

Cost ratios among program studies in the research efforts of the National Educational Finance Project[1] indicated that the following factors

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[1]R. L. Johns, S. K. Alexander, and K. F. Jordan, Planning to Finance Education, vol. 3 (Gainesville, Florida: National Educational Finance Project, 1971), pp. 1-77.

contributed to most of the variations in costs of programs:

1. Amount of time which individual students devoted to the program.
2. Pupil-teacher ratio of the program.
3. Nonteaching support required by the program.
4. Salary level of teachers assigned to the program.
5. Instructional materials, supplies, and equipment required to support the program.

As states revise their school support programs to incorporate pupil weights, significant progress must be made in school district accounting systems to provide adequate data for the revision and updating of the weights and indices so that policymakers will have adequate assurances that the weights will be indicative of sound educational practices rather than being self-fulfilling prophecies.

Candor dictates that recognition be given to problems which may relate to the application of cost indices or pupil weights to state school support programs. Such cost indices are most appropriate when used for statewide financial planning purposes. The use of cost indices in state school support programs permits fiscal planners to make more accurate projections of the quantity of revenue needed to provide adequate funds for the educational programs of all pupils. However, the index is merely an average; it has the theoretical and practical limitations of that mathematical derivation. Approximately one-half of the school districts in the state will be spending more than the statewide average and the remaining one-half will be spending less; therefore, using the average cost index for all educational programs on a statewide basis will not necessarily provide adequate funds for the specific educational needs of pupils in all school districts. As more reliable data become available, consideration

should be given to incorporation of adjustments for variations in costs of delivering educational programs and services and modifications related to economy of scale or the number of pupils served by the district.

A second major problem is that cost indices or pupil weights reflect current educational practice in most instances. They do not reflect in any way the educational soundness of the programs upon which they have been computed. Thus, such indices typically reflect what is currently being done rather than what could be or what should be done in educational programming.

A third observation is that cost indices or weights show the relative cost of educating pupils in special programs compared to the cost of educating pupils in regular programs. They provide no information as to how efficiently funds are being expended for either group. This condition serves to emphasize the need for a carefully monitored and well developed system of program audits to assure that the appropriateness of such indices can be interpreted properly.

The last factor which should be recognized is that the cost for similar programs will vary significantly among districts for a variety of reasons. Since pupil-teacher ratio is a major variable contributing to the differences in educational expenditures, this variation in such ratios will inevitably affect the index. Currently, the research has not addressed the issue of costs or expenditures varying with the type of delivery system used among local districts.

These caveats by Rossmiller[2] indicate the constant need to evaluate and restructure educational funding mechanisms to secure maximum effectiveness

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[2]Financing the Public Schools of Kentucky (Gainesville, Florida: National Educational Finance Project, 1973), pp. 150-1.

and efficiency in the expenditure of public funds as well as to provide adequate assurances that pupils are not being deprived of funds required to support their educational programs. Another factor related to the use of weights is the tendency to institutionalize existing programs with the result being that the process of change is retarded rather than accelerated by the new funding system. If classical program groupings are retained and state level bureaucracies are not prodded to "open up the system," the end result may well be a perpetuation of existing programs rather than an expansion of opportunities for districts to explore creative ways for providing educational programs and services.

Cost Differentials

Much of the recent interest in the weighted pupil approach to measuring educational need in state school support allocation formulas can be traced to the research conducted by the National Educational Finance Project. In Phase I of the project, efforts were made to select a national sample of representative "best practice" school districts, to identify educational program expenditures in those districts, and to develop indexes or cost differentials related to each educational program. Sample districts for the studies were drawn from several states and included a wide variety of types of school districts. In view of the wide differences in the types of school districts included in the sample and the fact that they were in several very different states, strong recommendations were made that the process be replicated in individual states when a state was interested in incorporating the cost differential approach into its allocation process for determining the educational need in various districts within a state.

Following the report on the national study, the staff of the National Educational Finance Project participated in cost differential studies in six states.[3] Findings from these studies have been analyzed and consolidated into a set of reasonable ranges for establishing full-time equivalent pupil weights for various educational programs.

The upper and lower limits for the various programs reflect the extremes found in the various research studies; data for programs are presented in Table 1. The one area of exception or possible question in the data is "speech handicapped;" the reasonable range weights may reflect expenditures on a participating pupil or caseload basis rather than on a full-time equivalent pupil. If this assumption is correct, the range of the weight for speech handicapped should be from 6.00 to 10.00. The same problem is related to the weight for the homebound or hospitalized child; in this program the range should possibly be from 10.00 to 15.00. In both programs the data problems are related to the concept of full-time equivalent pupils which stipulates that a pupil's time will be counted in the program only when he was receiving actual instruction. The cost differential method of allocating funds to local school districts has been enacted into legislation in Florida, Kentucky, New Mexico, Rhode Island, and Utah. Research data from these states, plus the data from studies in other states,

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[3]Gerald F. Boardman, K. Forbis Jordan, and Kern Alexander, NEFP Decision Process: A Computer Simulation (Gainesville, Florida: National Educational Finance Project, 1971); Financing the Public Schools of Florida (Gainesville, Florida: National Educational Finance Project, 1973), Financing the Public Schools of Kentucky (Gainesville, Florida: National Educational Finance Project, 1973); Financing the Public Schools of Delaware (Gainesville, Florida: National Educational Finance Project, 1973); Financing the Public Schools of South Dakota (Gainesville, Florida: National Educational Finance Project, 1973); Tish Newman Busselle, The Texas Weighted Pupil Study (Austin, Texas: Texas Education Agency, 1973); and Mississippi Public School Finance (Jackson, Mississippi: The Governor's School Finance Study Group, 1973).

TABLE 1

NATIONAL EDUCATIONAL FINANCE PROJECT REASONABLE RANGE COST DIFFERENTIAL SCALE FOR ESTABLISHING FULL-TIME EQUIVALENT PUPIL WEIGHTS FOR VARIOUS EDUCATIONAL PROGRAMS

Educational Programs (1)	Reasonable Range (2)
Kindergarten	1.05 - 1.30
Grades 1-2	1.00 - 1.30
Grades 3-8	1.00
Grades 9-12	1.10 - 1.50
Exceptional Education	
Educable Mentally Retarded	1.50 - 2.50
Trainable Mentally Handicapped	1.60 - 3.00
Physically Handicapped	1.50 - 4.00
Learning Disabilities	1.50 - 2.50
Emotionally Disturbed	1.60 - 3.70
Multiple Handicapped	1.65 - 2.29[a]
Homebound	2.40 - 2.60
Speech Handicapped	1.18 - 1.62[a]
Mentally Handicapped	1.49 - 2.33[a]
Compensatory Education	
Remedial Reading (Grades 1-6)	1.60 - 2.40
Vocational-Technical Education	
Business Education	1.40 - 1.80
Distributive Education	1.40 - 1.50
Trades and Industries	1.50 - 2.90
Health Occupations	1.40 - 2.70
Agriculture	1.60 - 2.60
Home Economics	1.40 - 1.70

Source: Financing the Public Schools of South Dakota (Gainesville, Florida: National Educational Finance Project, 1973), p. vii.

[a]Reasonable ranges taken from Financing the Public Schools of Kentucky (Gainesville, Florida: National Educational Finance Project, 1973), p. 6.

will provide additional insights into the appropriate level of weights for specific programs.

Weights are normally developed from current operating expenditures per pupil, including the fiscal accounting categories of administration, instruction, operation and maintenance of school facilities, fixed charges, and other school services. Expenditures for capital outlay, transportation, food service, and debt service are excluded from the analysis.

In 1974 the Institute for Educational Finance at the University of Florida conducted a study of cost differentials for the Florida Department of Education. The purpose of this cost analysis in twenty-four school districts was to provide data to be used in examining the weights which had been incorporated into the Florida Educational Finance Program enacted in 1973. The aggregated cost differentials are shown in Table 2.

Only one study has been conducted using the participating pupil instead of full-time equivalent pupils. Average weights were computed by the Texas Education Agency staff, with the assistance of the National Educational Finance Project; these data are shown in Table 3. The study was based on actual program costs per participating pupil in a sample of twenty-eight "good practice" Texas school districts. The cost indexes were based on 1970-71 current expenditures, excluding expenditures for capital outlay, debt service, transportation, and food service.[4]

In addition to the studies conducted by the National Educational Finance Project, several studies have been conducted on a smaller scale in research efforts at various universities. One particular study was conducted at Ball State University and was based on data secured from a random sample of eighteen Indiana school districts. Cost differential indexes were

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[4]Busselle, op. cit.

TABLE 2

FLORIDA PER PUPIL WEIGHTS FOR 24 SAMPLE DISTRICTS COMBINED FOR SCHOOL YEAR 1972-73

Educational Program	Aggregated Cost Differential Index for 24 Sample Florida Districts
Basic Programs	
Kindergarten-Grade 3	1.04
Grades 4-10	1.00
Grades 11-12	1.20
Special Programs, Exceptional Students[a]	
Educable Mentally Retarded	1.82
Trainable Mentally Retarded	2.12
Physically Handicapped	2.18
Physical and Occupational Therapy	5.58
Speech Therapy I	3.72
Deaf	2.33
Visually Handicapped I	14.15
Visually Handicapped	2.59
Emotionally Disturbed I	4.10
Emotionally Disturbed	2.34
Socially Maladjusted	1.92
Special Learning Disability I	4.48
Special Learning Disability	2.13
Gifted I	1.33
Hospital and Homebound I	7.20
Special Vocational-Technical Programs[b]	
Trades and Industries	2.00
Agriculture	1.93
Vocational Office Education	1.85
Home Economics (All Categories)	1.67
Distributive Education	1.84
Health Occupations	1.79
Special Adult and General Education Programs	
Adult Basic and High School	1.14
Community Service	1.07

Source: Cost Factors of Educational Programs in Florida (Gainesville, Florida: Institute for Educational Finance, 1974), p. 54.

[a]Special education programs for exceptional students marked with an I (one) represent part-time programs averaging seven hours in a 25 hour school week.

[b]Special vocational-technical program cost indexes represent the average of the aggregated cost indexes for each vocational-technical program category.

TABLE 3

TEXAS PARTICIPATING PUPIL WEIGHTS FOR VARIOUS INSTRUCTIONAL PROGRAMS

Programs (1)	Participating Pupil Cost Index (2)			Add-On (3)
Early Childhood Special Education		1.26		.26
Kindergarten		1.05		.05
Elementary		1.00		--
Middle School		1.12		.12
High School		1.28		.28
Special Programs	Elementary School	Middle School	High School	
Speech Handicapped	1.35	1.52	1.57	.57
All Other Handicapped	2.21	2.30	2.71	1.71
Low Income	1.37	1.38	1.51	.51
Non-English Speaking	1.77	1.67	1.67	.67
Migrant	1.47	1.51	1.81	.81
Argiculture		1.37	1.56	.56
Homemaking		1.21	1.38	.38
Trades and Industry		1.29	1.47	.47
Office, D.E. and Health		1.24	1.42	.42
Cooperative		1.23	1.41	.41
Handicapped Vocational		2.31	2.64	1.64
Coordinated Vocational-Academic Education		1.59	1.82	.82

Source: Column 2--Tish Newman Busselle, The Texas Weighted Pupil Study (Austin, Texas: Office of Urban Education, Texas Education Agency, 1973), p. 32. Column 3--Computations for the purposes of this study.

computed from an analysis of the current operating costs per full-time equivalent pupil in average daily membership for the school year 1971-72 using the basic elementary program in grades one through six as the index of 1.000. Findings of this study are shown in Table 4.

TABLE 4

INDEXES OF MEAN NET CURRENT OPERATING EXPENDITURES PER FTE PUPIL IN ADM BY SELECTED PROGRAM CATEGORY FOR A RANDOM SAMPLE OF INDIANA SCHOOL DISTRICTS

Educational Programs (1)	Cost Index (2)
Prekindergarten and Kindergarten	1.271
Elementary-Grades 1-6	1.000
Secondary-Grades 7-12	1.095
Mentally Handicapped	2.559
Physically Handicapped	2.821
Compensatory Education	1.633
Vocational Education	1.256

Source: Donald E. Embry, Program Cost Differentials for State Financing of Indiana Public Schools (Ed.D. dissertation, Ball State University, 1973), p. 81.

Under the auspices of the Governor's Office for Educational Research and Planning and the Texas Education Agency, a cost differential study was conducted in Texas in 1974.[5] The sample consisted of forty-one school districts. A reputational selection process was used to assure that the districts had programs which were representative of good educational practices in the state and also were sufficiently comprehensive to provide a balanced funding pattern for all educational programs being provided in the local district. Summary data from this study are presented in Table 5.

[5]Lynn Moak, Educational Program Cost Differentials in Texas (Austin, Texas: Texas Education Agency, November 1974).

TABLE 5

TEXAS EDUCATION AGENCY PROGRAM COST DIFFERENTIALS STUDY FOR SELECTED SCHOOL DISTRICTS, 1972-73
CALCULATION OF EDUCATIONAL PROGRAM COST INDEXES FOR ALL SAMPLE DISTRICTS

PROGRAM	WEIGHTED MEAN METHOD	UNWEIGHTED MEAN METHOD	
		DISTRICT	STRATA
	COST INDEX (ELEM=1.00)	COST INDEX (ELEM=1.00)	COST INDEX (ELEM=1.00)
REGULAR PROGRAM			
Kindergarten	1.04	1.29	1.15
Elementary	1.00	1.00	1.00
Junior High	1.03	1.04	1.05
Senior High	1.12	1.15	1.16
VOCATIONAL EDUCATION			
Argiculture	2.50	2.63	2.46
Distributive	1.21	1.25	1.13
Health	1.19	1.37	1.70
Homemaking-Useful	1.48	1.83	1.68
Homemaking-Gainful	1.32	1.29	1.21
Office	1.76	1.85	1.76
Industrial	1.97	1.98	1.95
Occupational Orientation	2.53	1.89	2.47
SPECIAL EDUCATION			
Visually Handicapped	4.38	4.59	4.31
Orthopedically Handicapped	2.39	4.91	2.37
Minimally Brain Injured	2.94	3.36	2.86
Auditorially Handicapped	3.48	3.60	3.87
Educable Mentally Retarded	2.83	3.52	3.12
Trainable Mentally Retarded	2.22	2.66	2.62
Speech Handicapped	5.97	6.25	5.41
Language & Learning Disability	2.76	4.65	3.66
Pregnant Students	1.29	2.10	1.86
Emotionally Disturbed	2.61	3.81	3.00
TOTAL REGULAR	1.03	1.04	1.05
TOTAL VOCATIONAL EDUCATION	1.63	1.79	1.71
TOTAL SPECIAL EDUCATION	2.81	3.23	3.19
GRAND TOTAL	1.11	1.14	1.14

In an effort to avoid problems associated with labeling pupils, to facilitate program revisions and modifications, and to increase flexibility in local school districts, some attention has recently been devoted to using a delivery system approach instead of a program method in designing a weighted pupil allocation system. The Massachusetts State Board of Education has proposed a program which includes the following categories with full-time equivalent pupil weights as indicated.

TABLE 6

FTE WEIGHTS IN RECOMMENDATIONS OF MASSACHUSETTS STATE BOARD OF EDUCATION

Program	Weight
Regular Day Program	1.00
Bilingual	1.40
Regular Education Program with Modifications (25 to 60 percent in special classes)	2.50
Substantially Separate	3.50
Full-time Day School (Exceptional Education)	5.00
Residential Program	6.00
Specific Occupational Training	2.00
Career Development	1.40
Career Awareness	1.10

This approach represents a significant departure in programmatic arrangement for funding purposes. State education agency approval would still be required for offerings fitting into the various programs, but

the structure is much more open because of the absence of traditional program titles.

The similarity in the research findings among the various states suggests that sufficient research has been conducted to permit states to enact a cost differential allocation process without engaging in extended and costly research. The basic program is more related to the willingness of the legislature to provide a process through which periodic adjustments can be made in the allocation indexes to facilitate the improvement of educational programs and to prevent the weights from becoming so institutionalized that they serve as a barrier to educational change in the same manner as the classroom unit approach to allocation has in some instances.

Summary

Decisions to incorporate pupil weights or cost indices into state school support programs should be carefully analyzed in terms of their public policy and educational program implications. Some of the benefits of the weighted pupil approach can be summarized as follows:

1. The system is not characterized by the structural restraints of the classroom unit allocation method which assume the continued maintenance of a self-contained classroom delivery system.
2. The computation process eliminates the possibility of local districts double counting pupils. For funding purposes, pupils are counted on the basis of the time which they spend in a particular program rather than being counted as full-time regular children and then receiving additional funds for participation in special programs.

3. State level fiscal planning is made more efficient through the use of a standard cost for pupils in various programs, thereby facilitating budget preparation.
4. A uniform and comprehensive system of funding is established for all programs in all school districts. Each component of the program is interactive thereby promoting a joint advocacy for state school support from all reference groups.
5. Adoption of the system facilitates evaluation by establishing the basic framework thorugh which programmatic budgeting and accounting may be conducted. Costs of programs are easily identified when the allocation procedure creates a full cycle of programmatic funding.
6. Funds are allocated on the basis of the number of pupils actually served in a program, rather than on a projection of the number to be served as is commonly used when state funds are allocated on the basis of a classroom unit.
7. State-level fiscal planners have the opportunity to exercise "policy-level intervention" into educational delivery systems by adding programs to the funding system or altering the weights to provide for additional investments into various programs. (An operational example of the point is the weight which has provided for grades 1-3 in the Florida Educational Finance Plan; that grouping of grades is funded at a higher level than other elementary or secondary grades, thereby encouraging a higher level of investment in the education of pupils in those grades.)

As a vehicle for allocating state school support funds to local school districts, cost differentials and weighted pupils afford local school districts

with the opportunity to introduce alternative delivery systems, foster the implementation of program and cost center fiscal accounting procedures, and provide a framework through which state-level policymakers can have assurance that the funds flow to the programs, schools, and pupils which generated the funds.